ABSTRACT OF THE DISCLOSURE

[1032] Training signals can be chosen based on stored prior connection information to reduce the use of extra tones in transmitted training signals and thereby improve receiver performance. By choosing training signals based on the stored prior connection information, it is possible to make the training signals indirectly a function of the loop impairments. One advantage of this scheme is that we can choose to omit certain tones in the training signals, based on previous connection information, on a loop-by-loop basis. For example, in an ADSL Transceiver Unit-Central office end (ATU-C) device, per-local-loop prior connection information may be employed to select DMT tones to be included in downstream training signals. Similarly, in an ADSL Transceiver Unit-Remote terminal end (ATU-R) device, prior connection information may be employed to select DMT tones to be included in upstream training signals. In each case, local echoes are effectively reduced and local receiver training is improved without affecting eventual data transmission performance in the other direction. As a result, higher AGC gain and higher signal-to-quantization-noise ratios can be achieved, especially in the case of long loops. These benefits can allow (1) improvements in the loop performance in the receiving direction and/or (2) reductions in the requirements on the receiving ADC. In addition, crosstalks into the other wire pairs, especially those in the same bundle, are also reduced, improving the transmission environment on those pairs.